Fine Tune Your IPTV Rollout for Success

Ensure that your Triple Play services are ready for prime-time with a comprehensive verification process so you don't get zapped

By: Deepesh Arora – Director, Application Layer Testing, Ixia

IPTV is the cornerstone of the Triple Play service offering that service providers are rushing to deploy across their networks. On a business plan, it allows them to offer differentiated services thereby ensuring continued customer loyalty, and as a result increased ARPU (Average Revenue Per User) across their existing network infrastructure. Services such as DSL (Digital Subscriber Line) and VoIP (Voice over IP) have been readily available for the last several years. Adding IPTV as the third leg of the Triple Play stool presents a seductive revenue picture, and as important as that target is, there's another more compelling reason to ensure a successful IPTV deployment; and that's survival. Offering Triple Play service to subscribers that is at least the same quality or hopefully better quality than the competition has, is a compelling must-have for any service provider wanting to stay alive and it all hinges on IPTV.

On the technical side, IPTV's demands are higher than the other two services that make up the Triple Play package. This is primarily because it arguably has the most visibility of the three services when its quality is below par, and because without contest IPTV requires the most bandwidth of the three. The other two services being delivered over the single pipe alongside IPTV are data and VoIP. These only require a relatively small portion of the bandwidth that IPTV does, and as a result, may be less likely to have quality issues.

Ensuring a successful Triple Play service rollout thus requires that the engineers, planners and designers involved in the deployment thoroughly test and verify the IPTV element of their offering, separately and then again in concert with the other two services, prior to rollout. IPTV cannot be tested in isolation because it's not delivered in isolation. A good general test plan for verification will keep delivered QoE (Quality of Experience), in this case delivery of video over IP, as the top priority. Several factors come in to play to achieve this goal, among which are considerations like minimizing channel zap/change delays and assuring acceptable delivery during peak load conditions. In addition, managing bandwidth, establishing benchmarks for network devices that ensure tight interoperation and validating network architectures all contribute to playing an active role in the final delivery of acceptable QoE.

In a sense, Triple Play networks are no different than traditional carrier delivery networks. Engineers have traditionally rolled out new consumer services and tested such deployments to ensure that they meet acceptable service levels at the end users', or consumers' premises. The difference is that with a Triple Play network you may be overlaying some additional equipment that is extremely CAPEX intensive. You're buying a very expensive billing system and advertisement splicing system.

Before focusing in on IPTV-specific verification, standard Layer 2 and Layer 3 validation tests should be run such as traditional routing and switching scalability and performance metrics tests using data traffic only because it's more resilient. Secondly, tests should be run to prove out system failover and device redundancy since these devices will ultimately be delivering consumer services again using a mix of data traffic, again using data. Once these baseline tests have been run, you can expand them into a context where there's voice, video and data traffic running simultaneously and re-run these same tests with this new, converged mix of traffic. After these tests have been completed, you need to add new voice and video quality specific tests that focus heavily on the end users' experience.

In particular, the focus will need to be on bandwidth issues. Services such as video put major constraints on the total bandwidth that is constantly available on the network. A network obviously has a fixed amount of bandwidth available and the network in question may not have been designed with this type of constraint in mind. In the traditional world, a network could be pre-tuned to prioritize particular types of traffic or a specific protocol like HTTP. For example, you may have one user that subscribed only to voice, another that subscribed only to data, a third to another service and so on. In the old world, users were offered different levels of service which really amounted to more or less bandwidth according to what they thought they needed; or wanted to pay for.

The service provider dealt with the QoS (Quality of Service) side of things by ensuring that the users who were paying for premium service got priority on the network. Those days are mostly gone. Today, all of these services are competing for bandwidth in one user's pipeline to their premises even though the customer may still be paying for different levels of service and more sophisticated means of ensuring QoE are needed. Enter dynamic provisioning of QoS in the form of advanced DPI (Deep Packet Inspection) devices on the network. These devices are constantly sifting through all the data traversing the network, prioritizing packets according to their type. DPI devices are not to be confused with management or monitoring appliances which behave more like probes. DPI devices are pass-through devices. The device may or may not act on traffic but it can be configured to automatically re-prioritize the network and do so depending on traffic type. The upside of this is increased flexibility to handle QoS.

26601 W. Agoura Road · Calabasas, CA 91302 USA · Tel + 1-818-871-1800 · Fax + 1-818-871-1805 · www.ixiacom.com

The downside to these advanced devices being added to the network is that the potential for added latencies and other factors is introduced. The new devices need to be benchmarked for tighter interoperation from the network design side. The network is transforming itself from a single service to a multi-service network. The simpler optimization needs of a single service network have become much more complex. Requirements like reliable scheduling, congestion avoidance and queue-sizes on routers need to be better tuned, in other words the networks must behave more intelligently. DPI is one example of the newer, more advanced elements that you're dropping into your system – which you want to be able to characterize. For example, let's say you already have a router from Company A that's smart enough to handle your current traffic, but how will it interoperate with another device to handle video from Company B? As a result these devices need to be further qualified and network designs need to be scaled to be sure the devices and the network is still performing to spec. Unless you plan on overhauling your entire system and going with a turnkey solution from one manufacturer, you have to keep very close track of the pulse of device interoperation.

Additionally, on the bandwidth side of these rollouts design architects need to utilize advanced algorithms and emerging encoding technologies such as MPEG 4 and H.264, which maximize the network's available bandwidth. For example, MPEG 2 currently widely in use cannot deliver HDTV over the vanilla flavor ADSL line. MPEG 2 HDTV consumes bandwidth in the range of 12 to 20 Mbps and standard ADSL lines cannot support these exorbitant numbers. The newer CODECs can shrink the old MPEG 2 bandwidth requirements from 12 -20Mbps to down to 4-8Mbps.

Ensuring that your IPTV rollout is ready for prime-time requires an across-the-board team effort. This effort must combine the skillful architecture of a robust, scalable network with the added, advanced devices considered into the mix, the utilization of the newest, proven CODECs that maximize bandwidth and minimize consumer "gotcha's" like channel change delay and poor video quality, with the assurance of a thorough service verification plan.